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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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TS0982, (US)

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02/25/2003

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EXAMINER

ZUCKER, PAUL A

ART UNIT

PAPER NUMBER

1621

DATE MAILED: 02/25/2003

19

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/804,891

Applicant(s)

DRENT ET AL.

Examiner

Paul A. Zucker

Art Unit

1621

-- The MAILING DATE of this communication appears on the cover sheet with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Current Status

1. This action is responsive to Applicants' amendment of 22 January 2003 in Paper No 17.
2. Receipt and entry of Applicants' amendment is acknowledged.
3. Claims 1-23 remain outstanding.
4. The rejections under 35 USC § 103(a) set forth in paragraphs 6 and 7 of the previous Office Action in Paper No 8 is withdrawn as moot in view of Applicants' cancellation of all original claims.
5. The rejection under 35 USC § 103 set forth in paragraph 6 of the previous Office Action in Paper No 15 is withdrawn as moot in favor of the new rejections below.
6. In view of the new rejections below, the finality of the last Office Action is withdrawn.

New Rejections

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Slany et al (DE 19840253-A1 03-2000).

Instantly claimed is a process for the hydrocarbonylation of pentenenitrile to produce 5-cyanovaleric acid in the presence of a group VIII metal source, a bidentate phosphine ligand and an acid having a pKa of less than 3.

Slany teaches (Abstract) a process for the production of 5-cyanovaleric acid or its ester which employs very similar conditions to those of the instant invention. Slany teaches the use of a catalyst system which comprises:

- a. a palladium(II) compound (Group VIII metal);
- b. a bidentate phosphine ligand; and
- c. an anion source.

Slany teaches (Page 2, line 67 – page 4, line 34) phosphine ligands corresponding to those instantly claimed. Slany further teaches (page 4, lines 55-59) that the anion source is an organic acid having a pKa of 3.5 or higher. Slany teaches (page 4, lines 63-65) mol ratios of from 1-10 with respect to palladium. The Examiner notes that the open “comprising” language of instant claim 1 allows this as well. Slany further teaches (Page 6, lines 7-10) reaction temperatures 40-200 °C.

The difference between the instant process and that taught by Slany is that in the instant process an acid of pKa less than 3 is required.

Slany, however, teaches (page 4, lines 60-62) that a strong acid may be added.

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The acids suggested by Slany include strong mineral acids such as perchloric acid or strong organic acids such as sulfonic acids and trichlor- or trifluoromethanesulfonic acids.

The instantly claimed process would therefore have been obvious to one of ordinary skill in the art. The motivation would have been to improve the process for production of 5-cyanovaleric acid taught by Slany by modifying it in the manner suggested by Slany. There would therefore have been a reasonable expectation of success.

8. Claims 14-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Slany et al (DE 19840253-A1 03-2000), as applied to claims 1-13 above, and further in view of Di Cosimo et al (US 6,077,955 06-2000).
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Instantly claimed is a process for the hydrocarbonylation of pentenenitrile to produce 5-cyanovaleric acid or its esters in the presence of a group VIII metal source, a bidentate phosphine ligand and an acid having a pKa of less than 3 and its further conversion to caprolactam.

Slany suggests (Page 2, lines 6-8) that 5-cyanovaleric acid or its esters are important for the production 6-amino-caproic acid and caprolactam. This constitutes a suggestion on the part of Slany that his process for the production of 5-cyanovaleric acid or its esters be combined with a process for the production of caprolactam.

The difference between the instantly claimed process and that taught by Slany is that Slany does not provide a specific process for the production of caprolactam.

Di Cosimo, however, teaches (Column 18, line 61- column 19, line 18) the reduction via catalytic hydrogenation of ω -cyanocarboxylic acids to the corresponding ω -aminocarboxylic acids and their subsequent cyclization to the lactams. In particular, Di Cosimo teaches (Example 37, Column 35, line 16 –column 36, line 10) the catalytic hydrogenation of 5-cyanopentanoic acid and cyclization of the resultant 5-aminopentanoic acid salt.

Thus the instantly claimed process would have been obvious to one of ordinary skill in the art. The motivation would have been to extend the process for the synthesis of 5-cyanovaleric acid or its esters taught by Slany to the synthesis of ϵ -caprolactam, an important polymer feedstock. This extension is, in fact, suggested by Slany. There would have been a reasonable expectation for success expectation for success since the ω -cyanocarboxylic acid (5-cyanovaleric acid) required for the process of DiCosimo is provided by the process of Slaney.

Conclusion

9. Claims 1-23 are pending. Claims 1-23 are rejected.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Zucker whose telephone number is 703-306-0512. The examiner can normally be reached on Monday-Friday 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann R. Richter can be reached on 703-308-4532. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-4556 for regular communications and 703-308-4556 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1235.

Paul A. Zucker
Patent Examiner
Technology Center 1600

February 22, 2003


Johann Richter, Ph.D., Esq.
Supervisory Patent Examiner
Technology Center 1600